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(71) Applicant: **IRDETO B.V.**
NL-2132 HD Hoofddorp (NL)

(72) Inventor:
Mooij, Wilhelmus Gerardus Petrus
1115 DK Duivendrecht (NL)

(74) Representative:
de Vries, Johannes Hendrik Fokke
De Vries & Metman B.V.,
Gebouw Autumn,
Overschiestraat 184 N
1062 XK Amsterdam (NL)

(54) **Digital television system**

(57) A digital television system comprises a communication network bus, a television connected to the bus, a decoder, a signal source connected to the bus, and a CA module. Communication between apparatuses connected to the bus thereby takes place according to a certain protocol. The CA module is connected to said bus, and the communication between the signal source, the CA module and the television or the decoder takes place via the bus. This obviates the use of special connectors for connecting the module to the television or to the decoder. In addition, two or more CA modules can simply be connected to the bus, and each CA module can be used by several signal sources and/or decoders.

EP 0 868 083 A1

Description

The invention relates to a digital television system comprising a communication network bus, a television connected to said bus, a decoder, a signal source connected to said bus, and a CA module, wherein communication between apparatuses connected to said bus takes place according to a certain protocol.

Systems of this kind are being developed at the moment, wherein the bus is known as "high-performance serial bus", as laid down in International Standard P1394. The decoder of such a television system may or may not be built into the television itself. In order to enable the use of pay television and the like, the decoder or the television must be capable of cooperation with a so-called conditional access module or CA module, which is capable of decoding encoded digital television signals by means of keys which are stored in a smart card, for example. In the usual television systems the decoder is provided with a connector, to which the CA module is to be connected. If the decoder is built into the television, it is also possible to provide the television with a connector for the CA module. Further systems are known, wherein the CA module is built into the television or into the decoder. Known television systems of this kind have several drawbacks. Providing a special connector for the CA module increases the production costs of the decoder or the television. In addition, the system is not very flexible, since only one or a fixed number of CA modules can be connected to the decoder or to the television. Furthermore, said CA module is only capable of cooperation with the television or the decoder to which it is connected.

The object of the invention is to provide an improved digital television system of the above kind.

In order to accomplish that objective the digital television system according to the invention is characterized in that the CA module is connected to said bus, wherein the communication between the signal source, the CA module and the television or the decoder takes place via said bus.

In this manner it is achieved that communication between the CA module and the television or the decoder is possible without providing the television or the decoder with a built-in CA module or with a special connector. In addition, a flexible television system is obtained, in that two or more CA modules can be connected to the bus, and each CA module can be used by several signal sources and/or decoders. Depending on the user's requirements, the decoder or the television uses one of the CA modules for decoding the desired programs/information.

If a digital video recorder is connected to the bus, the digital television system according to the invention has the advantage that the video recorder is capable of communication with the CA module or each CA module that is connected to the bus.

The invention will be explained in more detail here-

after with reference to the drawing, which is a very diagrammatic representation of an embodiment of the digital television system.

A television 2 comprising a decoder 3 is connected to a bus 1, wherein the digital television signals originate from a satellite receiver 4, which is likewise connected to bus 1. Satellite receiver 4 is one example of a signal source; other examples are a cable connection, an antenna connection, a digital video recorder or the like.

Certain channels may be used by suppliers of pay television or other services which use encoded signals, which can only be received by subscribers to whom the required keys are available. The decoding of the encoded signals takes place in a usual manner by means of a CA module 5, which cooperates with a smart card 6, for example, wherein the keys are stored in the smart card 6. In the illustrated system the CA module is connected to bus 1, so that the communication between the decoder 3 and the CA module 5 takes place via bus 1 in the protocol that is being used. The advantage of this is that the television 2 or the decoder 3 need not be provided with a special connector for connecting the CA module. Furthermore, the system described herein is highly flexible, because two or more CA modules can be connected to bus 1, wherein decoder 3 cooperates with that CA module which is needed for decoding the channel that the user has selected.

Furthermore it is possible with the system described herein that a digital video recorder 7 connected to bus 1 makes use of the same CA module 5 as television 2.

In the embodiment described herein the decoder 3 is built into the television 2. It is also possible, however, to use a separate decoder 3, which may be fitted between television 2 and bus 1, or which is capable of communication with television 2 via bus 1. In the latter case it is also possible, if desired, to use the decoder 3 as a decoder for digital video recorder 7.

It is noted that all devices connected to bus 1 are provided with a suitable interface, which converts the signals of the device in question into the protocol that has been selected for communication via the bus, protocol P1394, for example, or vice versa.

The invention is not limited to the above-described embodiment, which can be varied in several ways within the scope of the invention.

Claims

1. A digital television system comprising a communication network bus, a television connected to said bus, a decoder, a signal source connected to said bus, and a CA module, wherein communication between apparatuses connected to said bus takes place according to a certain protocol, characterized in that the CA module is connected to said bus,

wherein the communication between the signal source, the CA module and the television or the decoder takes place via said bus.

2. A television system according to claim 1, wherein 5
two or more CA modules are connected to said bus.
3. A television system according to claim 1 or 2,
wherein a digital video recorder is connected to the
bus, wherein said video recorder is capable of com- 10
munication with the CA module or with each CA
module that is connected to the bus.
4. A television system according to any one of the pre-
ceding claims, wherein said decoder is connected 15
to said bus, and wherein the communication
between the decoder and the television or the video
recorder takes place via said bus.

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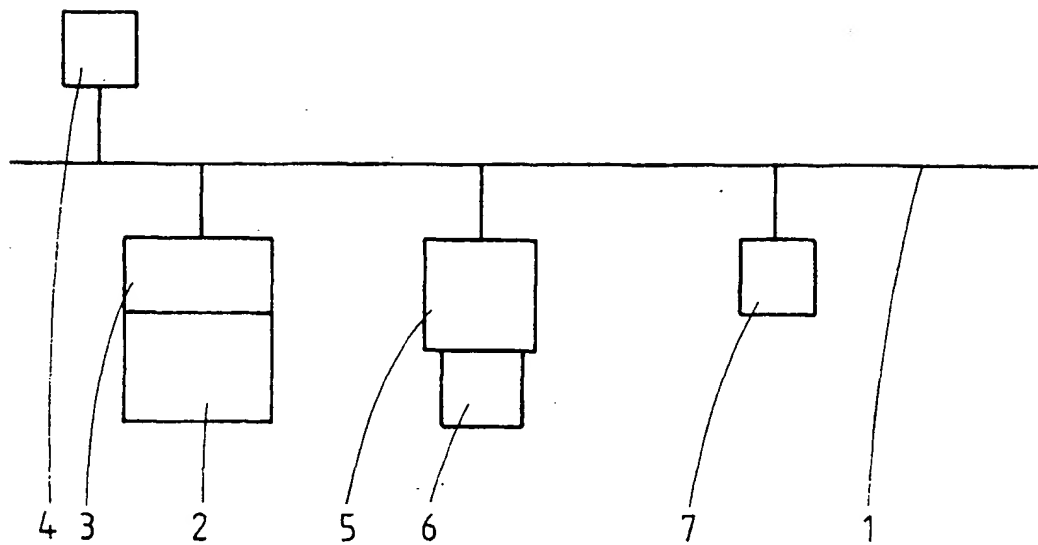
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EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	J.L. GIACHETTI ET AL: "A COMMON CONDITIONAL ACCESS INTERFACE FOR DIGITAL VIDEO BROADCASTING DECODERS" IEEE TRANSACTIONS ON CONSUMER ELECTRONICS, vol. 41, no. 3, August 1996, NEW YORK, NY, US, pages 836-841, XP000539543 * page 836, left-hand column, line 1 - line 34 *	1,2	H04N7/16
Y	* page 837, left-hand column, line 10 - page 838, right-hand column, line 56, *	3,4	
X	US 5 590 202 A (BESTLER CAITLIN B ET AL) 31 December 1996 * column 1, line 11 - line 28 * * column 2, line 35 - column 4, line 16 * * figures 1-4 *	1	
Y	WO 96 22633 A (BAUERSACHS PETRA ;CIBURSKI GUIDO (DE)) 25 July 1996 * page 1, line 3 - line 12 * * page 6, line 1 - page 11, line 59 * * figures 1-8 *	3,4	
A	US 5 461 674 A (CITTA RICHARD W) 24 October 1995 * column 2, line 37 - column 4, line 23 * * figures 1,2 *	3,4	
A	KAYS R: "ENDGERATE FUR INTERAKTIVE VIDEO-UND MULTIMEDIA-DIENSTE" RADIO FERNSEHEN ELEKTRONIK, vol. 45, no. 2, 1 February 1996, pages 53-56, XP000583083 -----		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25 May 1998	Examiner Van der Zaal, R
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	